

TRENT Technology REfresh for Navy Transformation

Objective

Rapid evolution of electronics technologies along with the downturn in procurement of new equipment has produced a consolidation of the defense industrial base and has caused DoD suppliers to shift their focus to commercial electronics markets (see Figure 1 and Figure 2). This is one reason why DoD weapon systems will be increasingly comprised of commercial off-the-shelf (COTS) components. Unlike previous custom-built DoD systems, COTS-based systems require a tailored in-service refresh strategy reflecting their different sustainment challenges.

Technology refreshment is the only viable means to sustain the capability over the service life of the system. Technology Refresh (TR) is defined as the periodic replacement of both custom-built and (COTS) system components, within a larger DoD weapon system, to assure continued supportability throughout its lifecycle.

Without TR, the DoD will not be able to adequately maintain and sustain its aging weapon systems over a prolonged service life.

To meet DoD transformation objectives, fleet capability must be able to change rapidly to meet evolving threats, but current approaches to TR constrain responsiveness. Upgrading existing systems is slow and expensive. This barrier could be substantially reduced by capability enhancements that are coordinated with obsolescence solutions or if re-designs were better informed by technology roadmaps.

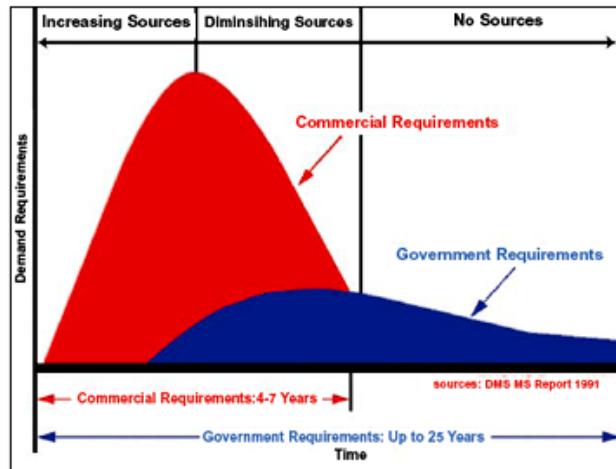


Figure 1 - DoD/NASA needs are not in sync with the commercial Electronic Marketplace. Graph courtesy of DMEA website

Manufacturers are currently unable to effectively manage TR so that solutions are optimized across issues of capability enhancement, technology roadmaps and obsolescence mitigation for timely improvements in weapon systems capability and flexibility. Capability enhancement and obsolescence management programs are done today, but as disjoint activities by different parts of an organization. Supply chain implications are seldom considered. Current efforts are narrowly focused on solving tactical, local, issues. Managers are often surprised and forced to spend most of their effort reacting to problems because they do not have the information to pro-actively work the issues. Several tools exist to address various aspects of the TR problem but they are fragmented, incomplete and offer little collaboration across the supply chain. No infrastructure exists to integrate the processes, information flows, and tools to effectively deal with TR in a comprehensive manner. The development of a planned and organized Technology Refresh program is critical to ensure long-term weapon system availability.

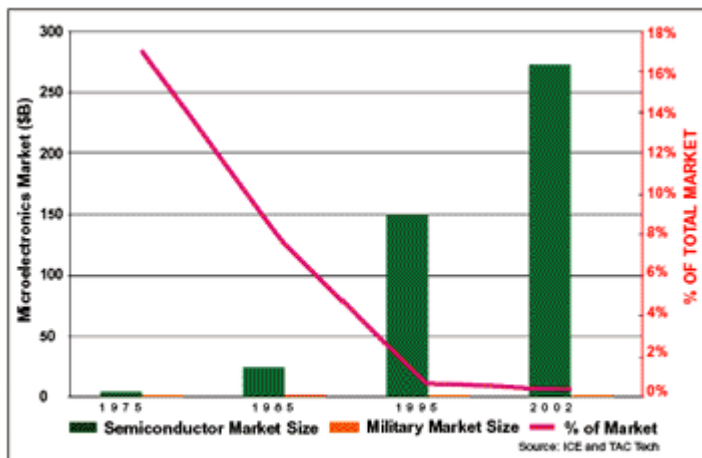


Figure 2 - shows military share of market is at an all time low. Graph courtesy of DMEA website

The American Competitiveness Institute (ACI) has partnered with Advanced Technology Institute (ATI), Lockheed Martin Advanced Technology Laboratories and Altarum to develop a new comprehensive Technology Refresh strategy. This new strategy will be a combination of processes, tools, and an information technology (IT) infrastructure that includes all stakeholders, so companies can manage TR as a comprehensive activity. This will enable transformational weapon system

products to be produced in a much shorter period of time. This solution will produce an optimized TR for any weapon system. It represents the most timely and cost-effective plan for refreshing a particular weapon system. It facilitates the decision making process of whether to perform technology insertion, technology refresh, or do nothing during the weapon system's planned availabilities. It will facilitate adoption of transformational capabilities. This solution is expected to speed improvements of Navy weapon systems by reducing the cycle time for introducing new technologies and enhanced capabilities by at least 25%. In addition, Operation and Support (O&S) costs should be reduced by at least 10%. These improvements will be achieved by integrating weapons system (WS) improvements and obsolescence resolution into a comprehensive TR process and tool set that can effectively manage the issues at the system to component levels.

Figure 3 illustrates the uses for our new TRENT TR tool kit along with the different types of users involved in the TR process. In the lower left is the Systems Engineer who is designing a module to meet requirements. The systems engineer is accessing the design tools necessary for this through the TRENT framework. In the upper right hand corner is the module supplier who is using a roadmapping tool to track new technology and make business decisions on when to stop supporting an older version of the module and start producing newer modules based on the newer technology. In the upper left corner is the TR engineer who is utilizing this information, including the current inventory level of existing modules from the Enterprise Resource Planning (ERP) database, to make better decisions on when and how to perform TR on the system.

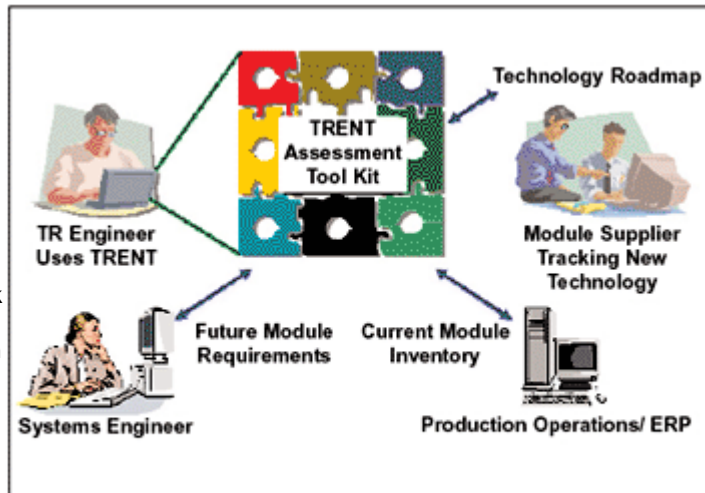


Figure 3 - Courtesy of the TRENT team (Lockheed Martin, ATI, and Altium) and the SPANS TRENT Program

Technology is very expensive to adopt when it is still considered State-of-the-Art. It would not be cost-effective to insert new technology into the weapon system at this point in its lifecycle unless it is absolutely necessary. However, at some point in the product's lifecycle, the cost of adopting new technology drops as it becomes more state-of-the-practice.

This is the ideal point for performing a technology refresh on the weapon system. If you wait longer, the cost will start to rise again because it is now considered obsolete technology and industry is moving towards adopting the next generation technology. Our TR solution will help identify this ideal point in the product lifecycle for doing cost-effective TR on weapon systems.

Figure 4 is a solution, that will be implemented as a web-based environment, integrating all of the required tools within a single framework that permits collaborative TR. The tools themselves do not have to be physically located at the same site as the users.

Examples of tools that will be used within our new solution include design tools, roadmapping tools, reliability analysis tools, decision support and optimization tools, as

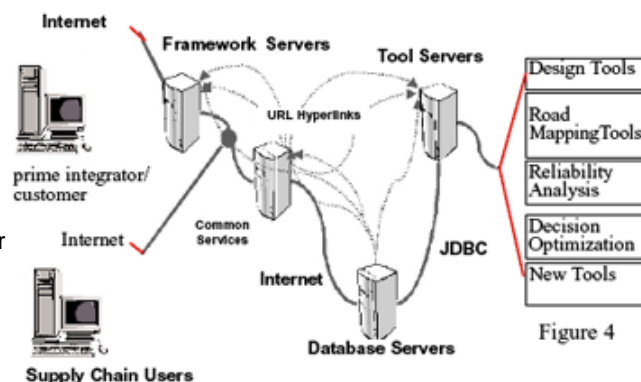


Figure 4



well as any new tools that need to be developed. The users will be able to access the tools and share data across the distributed enterprise using commercial internet capabilities and technology.

This effort is being jointly supported by SPANS (Supply Chain Practices for Affordable Navy Systems) and Navy ManTech which will combine "best of class" supply chain management with world class manufacturing sustainment and obsolescence mitigation practices.

If you are interested in additional information about TRENT Technology Refresh program, please contact the EMPF Helpline at 610-362-1320.